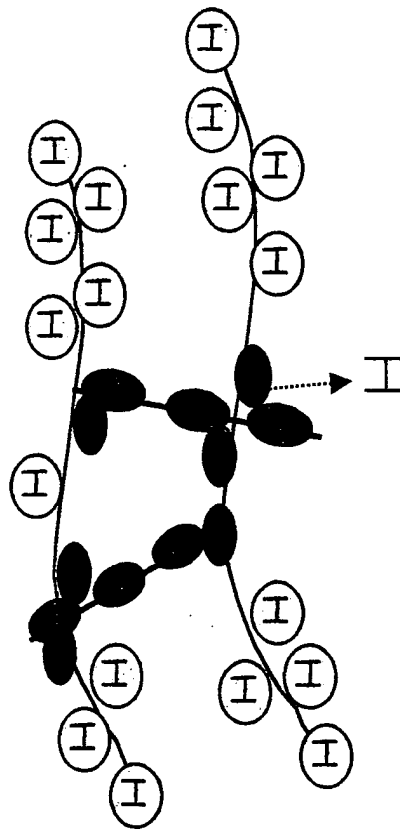


Figure 1.
Interpolyelectrolyte Complex (IPEC)
Dry Strength Enhancement
Polyacrylic acid example



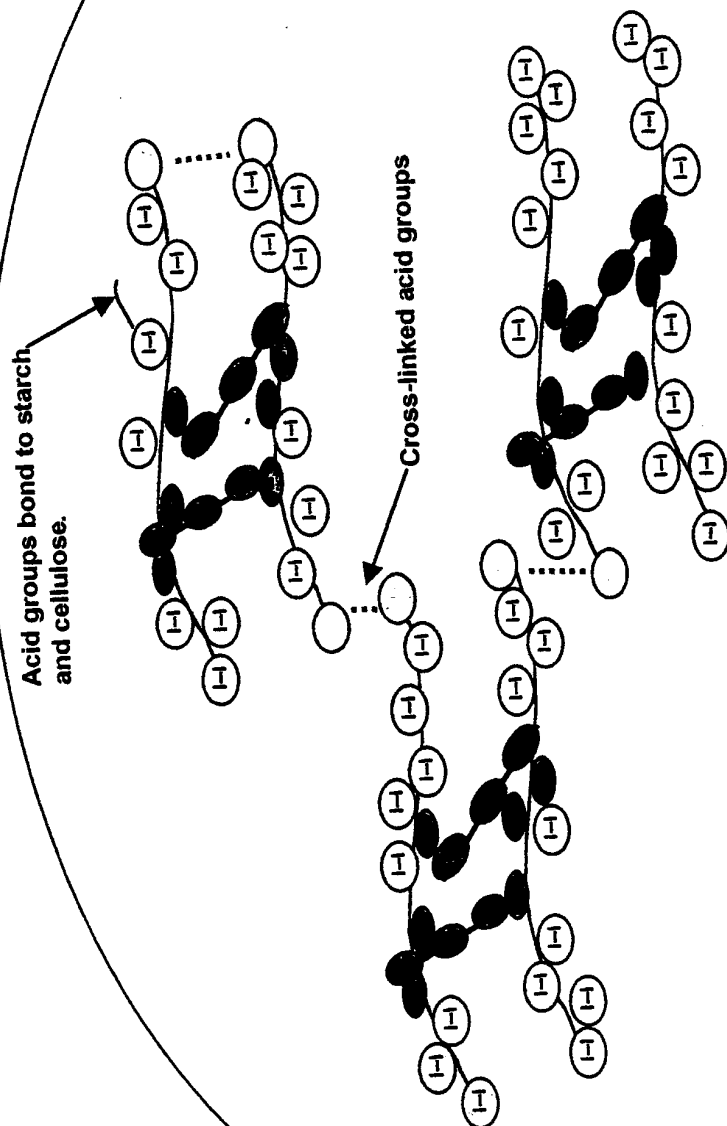
- Neutralized anionic COO^- acid groups, .33:1 to protonated acid groups
- ⊕ Functional COOH acid groups, 3:1 to anionic groups
- Cationic polymer, matched 1:1 to anionic groups
- H Proton from acid group, creating neutralized anionic group.

For the purpose of this study, the following hypotheses were formulated:

Figure 2.

IPEC plus Cross-linking and Binder Wet and Dry Strength

Functional groups attach to binder at elevated temperature..



Binder

Starch granule, latex, or hydrogel particle.

Figure 3.
Polyelectrolyte Surfactant Complexes (PESCs)
 Cationic Surfactant with Anionic polymer.
 Wet and Dry Strength

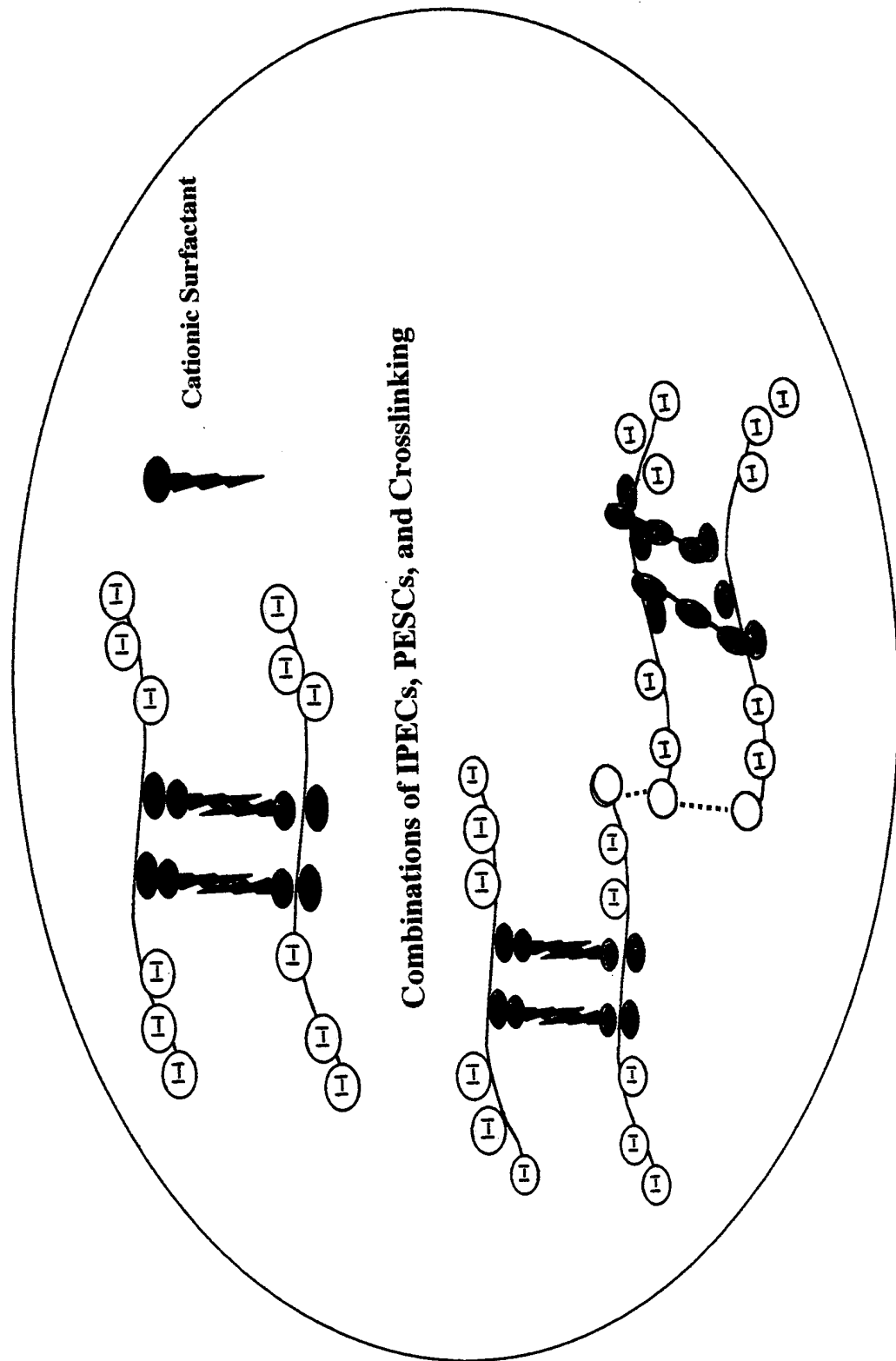
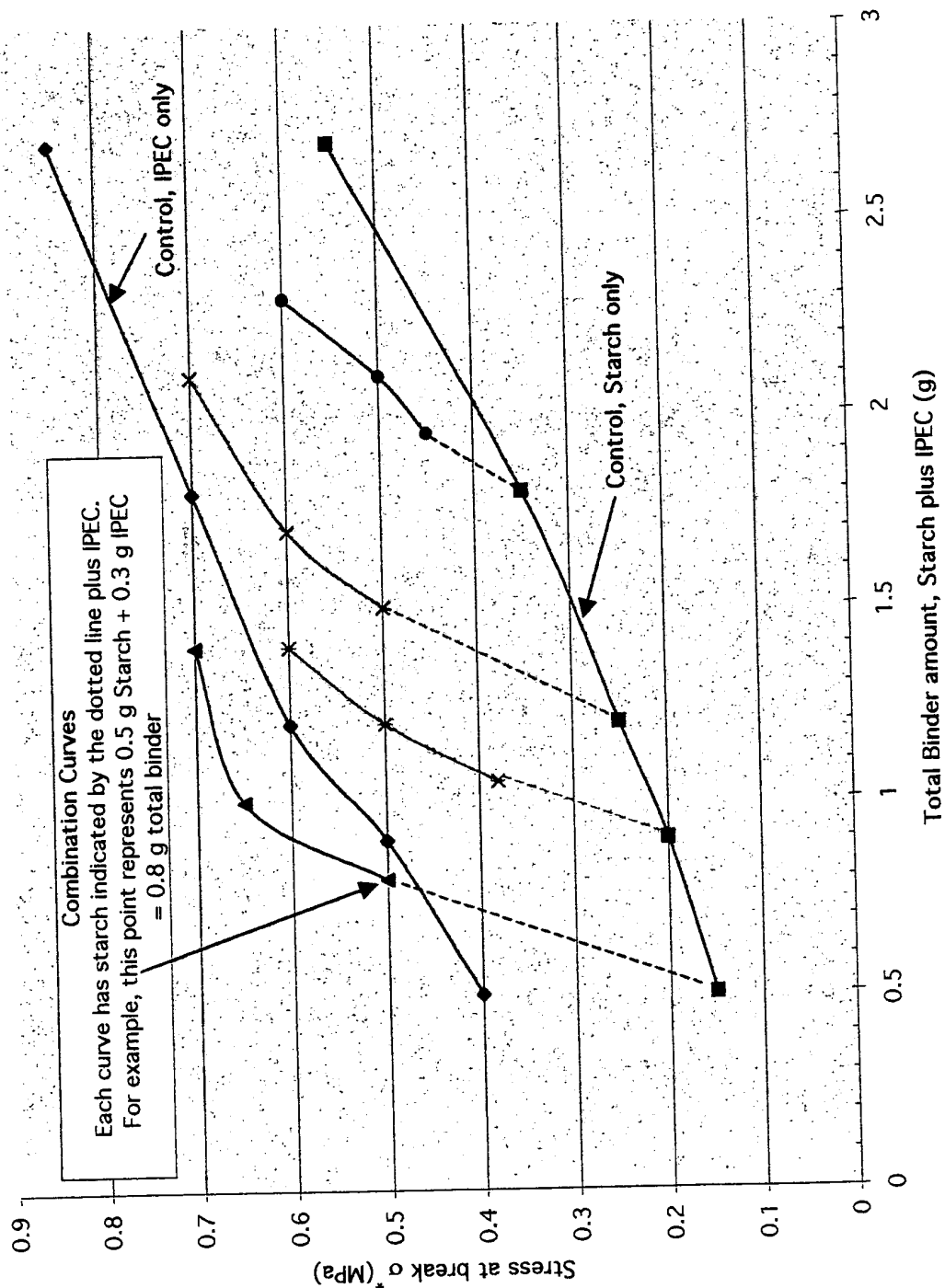


Figure 4
Synergistic Effect of IPEC and Starch on Dry Strength



Synergistic Effect of PESc and Starch on Dry Strength

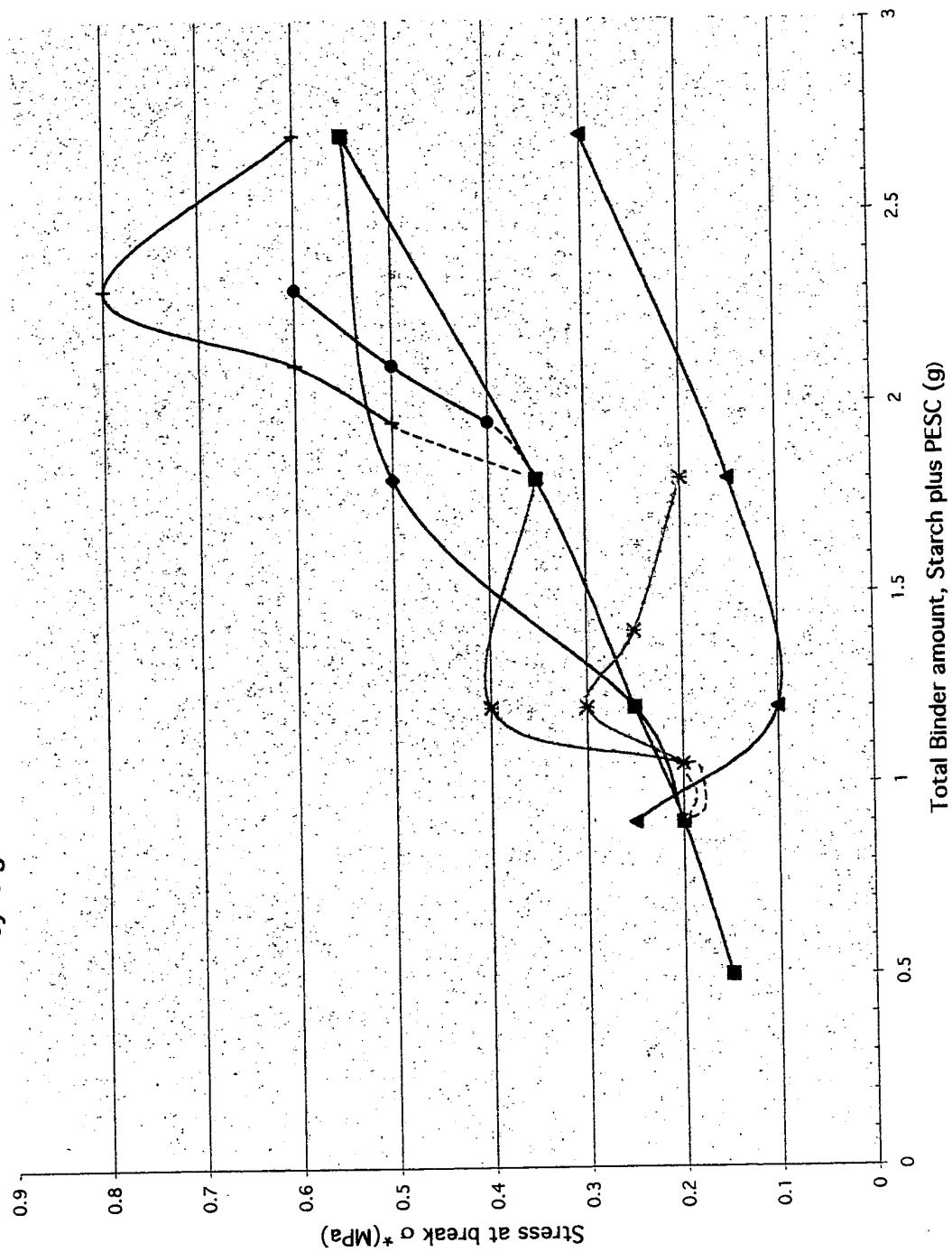


Figure 7
Synergistic Effect of Cross-linked (#)IPEC and Starch on Dry Strength

